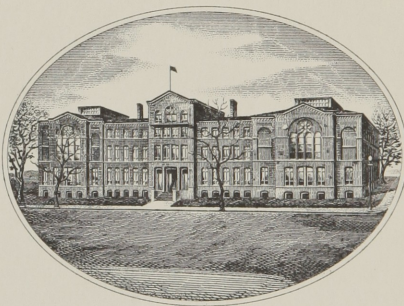


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Samuel Merrill
AN
INAUGURAL DISSERTATION

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TO

NATHAN SMITH, M. D.

PROFESSOR OF MEDICINE AT DARTMOUTH UNIVERSITY,

AND

CORRESPONDING MEMBER

OF THE

LONDON MEDICAL SOCIETY,

THIS

Dissertation

IS VERY RESPECTFULLY INSCRIBED

BY HIS

OBLIGED AND GRATEFUL PUPIL,

THE AUTHOR.

Dissertation on Fever.

THE great importance and intricacy of the subject have given rise to numerous essays, on the production and phenomena of fever ; and more time has been taken up, by medical philosophers, on this subject, than on all the other diseases to which animal bodies are incident.

In treating of fever, authors have generally endeavoured, in the first place, to give a definition of their subject. In doing this, they have enumerated certain causes, and fever as an effect, which, with other nearer or more remote effects of the same cause, go to make up their definition of fever.

The absurdity of introducing *anorexia, nausea, vomiting, dry skin, thirst, &c.* as constituting a part of a definition of fever must, on reflection, appear to every one.

In the present treatise, a *definition* of fever will be attempted ; an enumeration of its most important *concomitants*, or what have been improperly called phenomena of fever ; an essay on its *causes* ; with a few observations on the *prognosis* or judgment of its termination, and method of *cure*.

DEFINITION.

FEVER, considered as a disease, is a morbid excess of temperature, in the animal system, arising from a certain chemical change there taking place.

Fever may be local, that is, confined to some particular part of the system ; or it may be general, when the affection is apparently extended over the whole. When we speak of general fever, we would not be understood to mean that the febrile action pervades every part of the system, at the same time ; but that so great a part of the body assumes this action, as to destroy the balance, and place the system in a condition to be called general disease. So that our distinction, between general and topical fever, amounts to no more than this, that the former or general fever is that, in which the system, *from the beginning* of disease, appears to be generally affected ; and that the latter or topical fever, is a circumscribed inflammation, in any part of the body ; the cause of which was either insufficient, in itself, to draw the rest of the system into diseased action, or there was a want of febrile predisposition to aid it in its operation. Though when a similar cause is more powerful, or when the system favours its operation, this topical may terminate in general inflammation.

There are, no doubt, certain limits within which the temperature and other circumstances of animals may vibrate, without being in a condition which should be called disease. When any animal body, however, is in a state or condition, in the least varying from that which is natural, in a state of health and repose, that animal, in such a variation, approximates disease.

When, by the application of a stimulant power, or in any other way, the action of the system, or a part of it, is so far increased as to produce irregularity or disagreeable sensation; or when there is a diminution of action, by the abstraction of stimulus, so as to produce the same effects, it may then be said, there is disease in the system. For that which produces irregularity or pain cannot be called a healthy action.

As similar effects are produced by similar causes, and that in proportion to the causes, we believe it is the same kind of action which produces fever, that produces the healthy temperature in animals; that it is the healthy action, morbid in degree, tending to destroy the system. And the same action, as far as can be determined, takes place in topical as in general inflammation or fever. For if a *powerful* stimulus is applied to any part of the body, in its natural state, or if a *common* stimulus is applied to a local increased excitability, topical fever is induced; and the same cause, contin-

uing to operate with sufficient force, the febrile action is extended over the system, so as to produce what is denominated general fever. Instances of this we not unfrequently witness, in cases of wounds, phlegmons, &c. where the topical affection gradually extends itself, till the system becomes generally affected ; and the several stages, in the progress of a fever from this origin, are as regularly marked, as those in a fever from any other cause whatever.

Thus, from our definition and notions of fever, it will appear, that we consider the names which have been applied to the supposed varieties of fever, such as, *nervous*, *putrid*, *bilious*, *malignant*, *jail*, *hospital*, *worm*, *yellow*, *puerperal*, &c. as being entirely without natural foundation ; and, that fever, whatever phenomena may attend it, is ever one and the same.

Some fevers are said to be inflammatory, others, not inflammatory ; which is a solecism. Fever is an inflammatory disease, sometimes attended with strength, in the system, and sometimes with debility.

The epithets which have been applied to fever are of greater consequence than what arises from mere impropriety of expression. Improper names have, in many instances, led to wrong theory and wrong practice ; thus, to the terms *putrid* and *bilious*, thousands have fallen victims.

The idea of a multiplicity of fevers, doubtless, had rise in the various phenomena attending this disease, at different times. This variety was supposed to be owing to some peculiarity in the fever. Whereas, it is to be attributed to the peculiarity of the patient's habit or state of body, at the time of the attack of disease; to the variety of remote causes; and to the accidental attendants, during their operation. Which last circumstance has great influence on certain parts of the body; and on the degree and mode of action.

It should not, however, by this be understood that there is more than one kind of action to produce fever, immediately; but that there is a predisposition, in certain parts of the system, to diseased actions, which the cause of fever itself, or other causes, operating at the same time, may produce; and that irregularity of action, in the system, will take place, whenever any part, which has less power to resist diseased action, fails, or when the balance of the system is destroyed. And this happens, in a greater or less degree, in most cases of fever which continue for any length of time.

These circumstances, with others which might be mentioned, being taken into consideration, it is by no means surprising that fever, though always uniform in itself, should be attended with such a variety of appearances.

Dr. Rush has asserted the unity of fever; but by saying, at the same time, that it exists in different states, without having any reference to degree, it appears he has left it with nearly its former incumbrances. How fever, being a unit, can exist in different states, and in the same degree (as may happen according to him) can hardly be conceived. Nor can it be readily understood what he would have fever to be. He first tells us* that fever consists in an irregular or convulsive action of the blood vessels; and after relating several facts and analogies, he goes on to inform us† that he has been “led to believe, that irregular action or a convulsion in the blood vessels, is the proximate cause of fever;” which, had it come from an author less worthy and respectable than Dr. Rush, we should have been more ready to pronounce an inconsistency. The proximate cause, and fever itself, he has made the same thing.

Instead of Dr. Rush’s terms, “*Gangrenous, Typhus, Typhoid, Eruptive, &c. states of fever,*” those which better agree with the notion of its unity might be adopted; such as, *The Gangrenous, Typhus, Typhoid, and Eruptive STATES OF THE SYSTEM, with fever.* This change should be carried through the whole catalogue of states of fever.

It might have been mentioned before, that there is, at certain times, as after a glass of spirits with

* Medical Enquiries, Vol. iv. Page 134, Philadelphia, 1796.

† See 139th Page same Volume.

a full meal and violent exercise, more heat in the system, without the least attending irregularity, than, at other times, would be accompanied with the most dangerous commotion. In such cases, there being no predisposition to fever, and the circumstances which render it destructive not being present, the system again acquires its accustomed degree of action, without apparent injury.

The use to be made of these last observations is to show, that the increased action, occasioned by an over stimulus on *ordinary* excitability, is of a less dangerous tendency, than that, which arises from the application of a common stimulus to *increased* excitability.

PRECURSORS AND CONCOMITANTS.

THERE are commonly considerable changes, in the state of the system, previous to the accession of fever. The phenomena, which for the most part immediately precede it, and have been called symptoms, are with more propriety called precursors of fever. Some of these are the following : A feeble, and sometimes irregular pulsation of the arteries ; languor, with frequent yawning and stretching ; decreased activity of the intellectual functions ; a disagreeable sensation of pressure, in the region of the stomach ; paleness of the skin, and coldness of the extremities ; respiration small, frequent and anxious ; cold rigours shooting down the back and loins, thence over the body, attend-

ed with tremor of the whole frame ; copious flow of urine, pale and transparent ; pain in the head, back, joints, &c. anorexia, nausea, vomiting, diarrhœa, &c. After most of these have taken place, we notice an increase of action in the sanguiferous and glandular systems ; and, at the approach of fever, there is generally a florid countenance, with increased intellectual powers ; a dry and parched skin ; great thirst, with a dry and coated tongue ; a decreased quantity of urine, high coloured and without sediment. These mostly take place, as concomitants of fever, in every case, which is said to have a regular course.

There are many other phenomena sometimes attendant on fever, which are peculiar to the circumstances of the system labouring under disease. Some of these are stupor ; delirium, with a weak, fluttering, and irregular pulse ; epistaxis ; hemorrhoidal discharge of grumous blood, with obstinate diarrhœa ; petechiæ, vibices, &c. Others are such as depend on the peculiarity of their remote causes ; for it is well known that two very different causes may both produce fever, yet their other effects will be as different as their causes. Thus the phenomena attending fever, which arises from the introduction of variolous and certain other contagious matters into the system, are very different from those which attend fever from marsh effluvia. Among other concomitants attendant on fever, from the former cause, are to be

reckoned eruptions, such as appear in *small-pox*, *chicken-pox*, *measles*, *raſh*, &c. which have as juſt claim to a place among concomitants of fever as any of the others before mentioned.

THEORY OF THE PROXIMATE CAUSE.

AS we have defined fever to be ſimply a morbid exceſs of temperature in the body, it will follow of courſe that the immediate cauſe of this heat be conſidered the proximate cauſe of fever.

Caloric or anticrouon, we ſuppoſe to be an extremely ſubtle fluid, which, in a certain ſtate, has an affinity for all bodies, and on which the fluidity of all other bodies depends.

When this igneous fluid or matter of heat is combined with any other body, it is deſtitute of ſome of its otherwiſe leading characteriſtics; and may be ſaid to be neutralized. It appears as evidently to be ſo, as acids do, when combined with alkalis; for, when caloric is in a ſtate of combination, it diſcovers no diſpoſition to combine with any other body; which is all we mean by neutralization.

This neutralized anticrouon is the ſame as Dr. Black's latent heat; and that which is ſimple, diſengaged, and in a ſtate to form new combinations, is ſenſible heat.

The converſion of latent into ſenſible heat, by a decomposition of that body, of which the former is a part, and by which it is diſen-

gaged from the other part, is to be considered the proximate cause of fever. For,

As caloric, in its natural state, is combined with some other body, it appears, that sensible heat can be produced in no other way, than by decomposition; so that the heat of animals is produced in the same way as that, which appears in the ignition of combustible bodies. The manner of this decomposition may be briefly explained.

Fluids, such as the various gases, are composed of some one or more simple substances, combined with anticrouon or caloric. These gaseous bodies, by being brought into contact, or within the attractive sphere of some other body, may suffer a decomposition, by the operation of either a single or a double elective attraction. The constituent parts of the compound, in favour of which the elective power of attraction is exerted, will enter a new association or combination, and one or more may be set at liberty. The latter takes place in combustion, where there is a decomposition of oxygen gas; the oxygen combines with the burned body, while the anticrouon is disengaged in form of sensible heat.

The air which we respire is a heterogenous fluid, composed of oxygen, azote, carbonic acid and caloric. The oxygenous part, however, is the most important in respiration; for it is a decomposition of this, whose constituent parts are oxygen and caloric, by which the heat of the body

is chiefly produced, and other important purposes of the animal economy are accomplished. Without this constant decomposition, animal life could no more be supported than without animal organization. For the caloric, thus in its simple state, as we shall again have occasion to mention, is that without which the different parts of the body could not receive the principle, which, in its different modifications, produces both irritability and sensibility; and the oxygen is the stimulus by which the blood produces that powerful and important action of its own vessels.

That the contraction of the heart and arteries depends on the stimulus of oxygen, operating on their excitability, is evident from experiments.

Von Humboldt took the heart of a frog, from the pericardium, which was left till it ceased to pulsate more than once on the application of mechanical stimulus. Its upper vessels were tied, and it was hung perpendicularly in oxygen gas. It instantly began to beat of itself; and when, after four minutes, it was brought back into the atmosphere, it beat fourteen; and sixteen minutes after, it beat only five. It was again hung in oxygen gas, and the pulsation increased in eight minutes to twelve, in twenty to seventeen, in twenty-six to twenty, and in seventy-three to twenty-nine strong contractions.

Another heart was tied up and suspended in atmospheric air; in the first minute it beat 9 times;

carried into oxygen gas, in four successive minutes it beat 23, 30, 35, and 38; brought into the atmosphere again, its contractions were diminished. Other experiments might be related to show the importance of oxygen in the animal functions.

To return more directly to our subject, we may observe, that it is not in the lungs alone, that the important decomposing process is carried on; but likewise, in a degree, over the surface of the whole body; or a part of it, as in topical inflammations. This will not be discredited by any one who will be at the trouble to consult the experiments of the ingenious Dr. Beddoes. Thus as the decomposition of oxygen gas, on the surface of the body, is the same as that in the lungs, only differing in degree, by explaining the latter, the former will be explained; which may be done in the following simple manner.

The blood of animals and oxygen possess a certain affinity for each other. This appears evident by exposing a quantity of venous blood to substances from which oxygen is readily disengaged; a combination immediately ensues, and the blood assumes a beautiful scarlet colour.

The action of the muscles of the thorax enlarges its cavity, which, upon a well known principle, is immediately filled with atmospheric air. The oxygen of which, being thus brought within the attractive sphere of the blood, there disposed for the purpose, combines with it, while a portion of

anticrouon or caloric, either healthy or morbid according to quantity, is disengaged. As this anticrouon, thus in its simple state, has a tendency to equilibrium; or, as was before observed, has an affinity for all bodies, it readily enters and communicates warmth to the oxygenated blood and parts about the organs of respiration; and thence pervades the whole body.

Thus the simplicity of nature is such that the blood is oxygenated, the animal warmed, and several other important purposes answered by the same process.

Having thus considered the *proximate cause of fever*, it will now be proper, and according to our order, to make a few observations on the

PREDISPOSING CAUSE.

THE predisposing cause of fever is that, which gives a disposition to a part or the whole of the body, to carry on the process of decomposition to such a degree, as to produce the morbid temperature aforementioned. What this is, we shall endeavour to explain.

In the formation of animals, the part first formed, is that important viscus, the brain. Its substance, figure, and the various phenomena attending its action lead us to a belief, that it is a glandular organ; which, like the other glands, secretes its fluid, to be distributed over the body.

The brain we should call the sensorial gland; which we shall find gives origin to the principle of animation or animal-vital power.

The excitability, as it has been called, or that susceptibility of which an animal body, in health, is possessed, viz. of being brought into action by the application of stimulant powers, has, very evidently, its origin in the brain; for by whatever means the communication of any part of the body with that organ, by the nerves, is either partially or totally destroyed, the part becomes paralytic or insensible in the same proportion.

The term animal-vital power, or principle of animation, is proper to be applied to that, whatever it is, which gives to the animal body a susceptibility of being stimulated into action. And this we believe to be a fluid secreted by the sensorial gland; which is therefore to be called the sensorial fluid. The reasons for believing it to be a fluid, since it cannot be subjected to the scrutiny of the senses, are, 1. Because all other glands, with whose use we are acquainted, secrete fluids. 2. The greater facility with which certain phenomena may be accounted for on this principle, than on any other, which has been adopted; and 3. It seems more analogous to other parts of the animal economy, with which we are better acquainted.

The nerves are to be considered as excretories to the sensorial gland; and as they give direction

to a fluid extremely fubtle, and like the electric fluid invifible, confequently not requiring vifible tubes for its circulation, may be called fenforial conductors.

The prefence of the fenforial fluid is abfolutely effential to life ; for no animal motion can be performed without expending or changing a portion of it. So that the action of all the other organs in the body depends on the action of the fenforial gland. This fecretes its fluid, which is conveyed by the proper conductors to the different parts of the body, producing irritability or a fufceptibility of ftimulation.

If it fhould be asked, how the prime animal gland firft acquired its fufceptibility of being actuated to fcrete the fenforial fluid ; it may be answered, that it was derived from the parent organ ; and that its action is kept up by the operation of electricity, and perhaps oxygen, with fome other ftimulants, on its excitability ; which laft is constantly fupplied by the fluid fcreted in its own body. The ftimulus of electricity on the fenforial fyftem is feen in the ufe of electric fhocks, in apoplectic and paralytic affections.

Should it be further enquired, from what the fenforial fluid is fcreted, we may venture to conjecture, that it is fcreted from the electric fluid, or fomething analogous to it ; of which, what has been called animal electricity or galvanifm may probably be but an excrementitious

modification ; and yet, of itself, answer no unimportant purpose in the animal economy.

The many experiments, which have been made by Von Humboldt and others, go to prove, that the similitude between galvanism and electricity is very considerable, though in some respects they are different. This we take to be not unfavourable to the idea suggested, that the galvanic fluid is a modification of the electric, or produced from it, by a glandular action in the body ; that the sensorial fluid is secreted from the electric, and that the galvanic is the residue. Or as may, perhaps, appear more probable to some, that the galvanic is the sensorial fluid somehow changed, as was before hinted, by the part it has acted in the animal motions.

We would not suppose, as some have done of excitability, that every animal, at the commencement of life, has a certain quantity of sensorial fluid laid up in store, which is to last till life is finally extinguished ; but that the sensorial gland is continually secreting its fluid ; and, that without this continual secretion, the animal body would soon become an irritable mass.

Much the greater part of the sensorial fluid, which is secreted, is expended by the involuntary motions ; as is evident by the rapid and sometimes dangerous accumulation of it, occasioned by a partial or total cessation of them, in any part of the body ; which circumstance is of much im-

portance to be attended to, in the doctrine of diseases. Thus the application of cold to the surface of the body, the exclusion of light and sound from the organs they are calculated to stimulate, or the abstraction of any stimulus already present in the body, by decreasing the action, produce an accumulation of sensorial fluid, and consequent increased irritability in those parts, whose action has thus been diminished. For the sensorial gland continues its secretory action, and the nerves conduct the fluid ; while but a small part of it is expended, during this deficiency or under proportion of stimulus applied. And as the action of a part or the whole of the body is in exact proportion to the product of the sensorial fluid there accumulated, multiplied into the degree of stimulus applied ; it is very evident, that cases may frequently occur, where a stimulant power, not exceeding what has been ordinarily applied, will produce alarming consequences.

Increased action and heat on the surface of the body, while the vital motions are performed with less than ordinary energy, we instance in many cases of fever. In others we observe an increase of heat on the surface of internal cavities ; or violent action in the sanguiferous system, while the surface of the body is at little more than natural temperature.

That partial accumulations of the sensorial fluid not unfrequently happen, we conclude from

the cases last instanced ; where violent action, in certain parts of the system, is a consequence of the application of common stimulants over the surface of the body generally ; while the same cause produces very little if any effects on other parts, not so circumstanced.

From this consideration we are led to believe, that in almost every instance of disease, except those induced by the application of some violent stimulus, there is a disproportion in the body with regard to the irritable fluid, which occasions a disproportion and irregularity of action, with a tendency to the destruction of the whole animal machine.

The quantity of fluid secreted by the brain is sometimes insufficient to support that degree of action, which is necessary to the health and vigour of the system ; or some particular part of the body may, from a partial accumulation, have acquired an increased action, which, in a certain manner to be mentioned, is kept up, destroying so great a proportion of the sensorial fluid, that the system, generally, becomes illy supplied. Either of which constitutes a state of debility ; the one, where there is a deficiency secreted, the other, where there is a misapplication.

The manner, in which an over proportion of the vital power or sensorial fluid is conducted by any particular nerve or branch of nerves, and expended or changed, robbing other parts of their

neceſſary ſupply, may be thus explained. The increaſed action of decomposition commences at the extremity of a conductor or its branches, by the application of a powerful ſtimulus, or the reapplication of a common ſtimulus, to an increaſed irritability. The caloric or anticroon, together with the oxygen diſengaged in this decomposition, have the power to ſtimulate or increaſe the conducting power of the nerve, above what the other nerves of the body poſſeſs ; while the oxygenated blood and other ſtimulants operate, through the medium of the veſſels and organs of the part, to expend or change its properties, as it arrives.

Thus there is formed a kind of circle of motions. By the decomposition, the flow of the ſenſorial fluid is increaſed ; while this fluid increaſes the attractive power of the blood for oxygen, by which the decomposition is ſupported. This circle of motions thus ſupports itſelf till the ſtate of the ſenſorial conductors and parts concerned in the action is ſo changed, that they gradually ceaſe to obey the ſtimulus applied to them, which leaves ſo much of the body, as has been thus affected, in a condition, termed by Dr. Brown, indirect debility ; while the reſt of the body, by being deprived of much of its portion of the ſenſorial fluid, and at the ſame time not being under the operation of more than its natural ſtimulus, will be found to be in a ſtate of de-

bility, different from either the direct or indirect of the above named author.

As was before stated, by whatever means there is an accumulation of the sensorial fluid, more or less extensively in the system, certain parts are subjected to greater action than the healthy, while under the operation of common stimuli. Among the other organs, whose irritability is increased by this accumulation, we must frequently reckon the blood vessels; these being stimulated, by their proper fluid the blood, throw their contents with increased momentum to the surface of the body, while the action of the discerning vessels is, at the same time, proportionally increased. All which favours the decomposition of gas and the evolution of anticrouon; which last is the stimulus for keeping up the flow of sensorial fluid.

We might have mentioned before the further evidence of an accumulated sensorial fluid in certain parts of the body, which is derived from the increased sensibility there, in inflammations.

This accumulation or increased quantity of sensorial fluid, by increasing the power of the blood to attract the simple principle of oxygen, as it evidently does; thus giving a tendency to an increase of the decomposition before spoken of, we consider the predisposing cause of fever.

REMOTE CAUSES.

THE remote causes of fever are numerous. They are all those, which directly or indirectly lay a foundation for an accumulation of the sensorial fluid.

With regard to the various substances, which, when applied to the body, operate to produce fever, we may observe, that it is by no means necessary to suppose that their immediate operation is in any way to increase the action of the system. They may, and for the most part probably do, operate to *diminish* the quantity of action. This may be effected in several different ways. 1. They may combine with a portion of the sensorial fluid and destroy its mobiliferous quality; thus immediately rendering the part incapable of being actuated by the stimulus present. When a part, however, has, in this way, acquired a torpid state, a considerable accumulation of sensorial fluid will happen, before it will again be roused by natural stimulus; though the action, when commenced, will be in proportion to the accumulation which had taken place. 2. They may enter into combination with the natural stimulus and render it inactive. 3. They may take the place of more active stimulants, as when we inhale air less pure than the atmospheric. 4. They may imbibe the stimulus of sensible heat, in passing from a solid to a flu-

id state; as when soluble substances are taken into the stomach, &c. &c.

We would enumerate among the most frequent remote causes of fever, human and marsh effluviæ; exposure to a temperature below 62 degrees of Fahrenheit, or a less degree of cold accompanied with moisture; intemperance; excess in venery, &c.

We are sensible that some of the above operate to the exhaustion of the sensorial fluid rather than to the accumulation of it. This, however, can be no objection to our theory; for we contend, that an exhaustion of the sensorial fluid may, and frequently does, lay a foundation for its subsequent accumulation; as was before hinted.

Very much to our advantage, on this subject, we have the authority of the justly celebrated professor, Dr. Rush; he observes* that increased excitability does not take place in cases of *direct* debility alone, as Dr. Brown supposed; but that it happens, likewise, in every case of *indirect* debility; where it is suddenly induced upon the system. So that we need not hesitate to say, that what we have mentioned as remote causes of fever, either directly or indirectly, produce an accumulation of the sensorial fluid.

* See Medical Enquiries, &c. Vol. 4.

PROGNOSIS.

WITH regard to the judgment we form, concerning the termination of disease in patients afflicted with fever, we should be influenced by various circumstances. All the concomitants should be taken into consideration; and the balance and power of the different parts of the system, accurately observed.

Some of the appearances in the system with fever, which should lead us to predict an unfavourable termination of disease, are the following: Twitching of the tendons; inflamed eyes with staring; speech quick and stammering, with an unnatural voice; violent delirium; perpetual watchfulness; constant nausea and vomiting; obstinate diarrhœa; pulse slow and the disorder of the head increased; eye-balls fixed and sunken; cold extremities and tremor of the tongue; blindness; difficult deglutition; a strong disposition in the patient to lie on his back; frequent attempts to arise from bed without being able to assign any reason; involuntary and extremely fetid stools; hemorrhages attending extreme debility; and, indeed, violent action in the sanguiferous system, as it leaves dangerous debility, should be considered alarming.

Some of the symptoms, indicating a favourable termination, are, the raising of the pulse by cordials; abatement of stupor, tremor, and other affec-

tions of the brain; turbid urine, in the decline of the disease; a gentle sweat or moisture over the body, or even a soft skin, with a moist tongue; loose stools succeeded by diaphoresis. These, too, are to be considered more especially favourable, when they happen on the third, fifth, seventh, ninth, eleventh, fourteenth, seventeenth, or twentieth days, of the disease.

CURE.

TO diminish or destroy the morbid excess of temperature, in the system, the management may be exceedingly simple. As sensible heat has a tendency to equilibrium, by applying to a heated body one of a lower temperature, the heat of the former will be diminished. The evaporation of fluids likewise from the surface of the body, by the combination and neutralization of antiscorbutic, in that process, has a powerful effect in diminishing the heat of the system.

Since we consider the fever, in itself, of a less dangerous tendency, than many of its concomitants, much attention, in the treatment of disease, should be directed to the latter.

An immoderate degree of action, in whatever part of the system it may have taken place, is pernicious; it is, therefore, an important indication of cure, to diminish this action; which is answered by removing or diminishing the stimulant powers, which are either operating themselves, or

assisting others in their operation, to produce it.

One of these stimulant powers is the oxygenated blood ; which may be diminished by venesection. But as this evacuation is very permanent, in its effects on the system, it should be practised with the greatest caution. For whenever any considerable quantity of blood is taken ; and especially if this practice is resorted to in a late stage of the disease, a dangerous debility is very liable to ensue.

To venesection, we would generally prefer evacuations of the first passages, by emetics and cathartics ; and likewise a diminution of external stimuli ; though in some cases all these may be found necessary. Impressions on the external senses, as much action depends on their stimulus, should, as far as possible, be avoided ; more especially such as give pain and uneasiness to the patient. External heat should be attentively guarded against, as well as every thing, which has a tendency to increase the heat of the body ; except, when something of this kind is necessary, in producing diaphoresis.

Exertions of the body and mind are to be discouraged ; and aliment given in small quantity, with as little stimulus as possible. The thirst which arises in high fever, with increased action of the sanguiferous system, is to be allayed with cool and perhaps acid drinks ; while that attend-

ing debility is to be treated with warm and stimulating cordials.

To remove the irritation arising from a preternatural retention of the fœces, we prefer mild enemas to purgative medicines; as the object is accomplished by the latter, with much less uneasiness to the patient, than by the former.

The use of opium in diseases with arterial strength we believe to be pernicious, unless from excessive restlessness and watching it may be given to diminish the irritability; so that the effects of other stimulants may be avoided.

We have so far mentioned the use of what may perhaps properly be called negative means of decreasing action; or those which decrease it, by the abstraction of stimulus. It may now be proper to speak of certain powers, which, if we mistake not, are immediately active in producing the same effect. Some of these are the different gases when taken into the lungs, such as the hydrogeous, carbonaceous, septous, &c. Any other air, which contains less oxygen than the atmospheric, may be serviceable, by giving less stimulus than the latter, which would otherwise have occupied the same place.

Certain medicines, under the name of refrigerants, have been much employed for the same purpose, such as the neutral and metallic salts; but their efficacy, in the quantities generally adminis-

tered, is very doubtful ; and when given in large quantities, are frequently injurious.

Acids, and especially the vegetable acids, may be serviceable ; not in decreasing the fever, already present in the system, but in diminishing the febrile action. This we suppose to be effected by means of the blood's being partly saturated with the oxygen of the acid : for which, as before stated, it has a strong affinity. The blood, being thus partially saturated with oxygen, has a less powerful affinity for that substance ; and by this mean the decomposition which produces the fever is diminished.

Ipecacuanha and other emetic drugs given with cool drinks, in doses to produce nausea or even vomiting, are many times serviceable.

The disproportion of action between the arterial and venous systems, with fever ; as also between these and the glandular system, is many times considerable ; and to diminish or remove this should be considered among the indications of cure ; which may be answered by the use of a variety of medicines, such as opium, mercurials, foxglove, &c. &c.

When there is general debility and torpor in the system, with fever, every unnecessary expense of the sensorial fluid should be carefully avoided ; and such remedies used as are supposed to increase the power of the system ; such are opium, bark, wines, various preparations of iron, snake root,

orange-peel, camomile, bark of wild cherry (*prunus cerasus*) columbo, cantharides, sinapisms, a moderate degree of heat, electricity, &c. &c.

To enumerate all the remedies, which are proper to be used, in the different states of the system, with fever, with the particular circumstances of the patient to which each is properly administered, and the various modes of exhibition, it would require limits to be set, far beyond those of an inaugural dissertation.

We have, therefore, contented ourselves with general remarks; and close, on this head, by just observing, that when appearances indicate a disposition to putrescency, in the system, fixed air and alkalis are proper to be administered.

WITH regard to the *operation* of particular *remedies*, in the cure of diseases, we would here just observe, that we believe many of the most valuable substances, in medical use, produce their good effects, in the diseased system, merely by commencing and continuing, for a time, an action peculiar to themselves; and not (as according to the fashionable theory) by being more or less *stimulating*, and producing a greater or less *quantity* of action.

No matter what their action is, provided it be different from that meant to be cured. For there is evidently, in the system, a tendency to healthy action; and whenever any cause is operating to keep up a diseased action, if a remedy sufficiently powerful to overcome that action, by producing one peculiar to itself, be administered, and its operation begins to diminish, then the efforts of the system are to pass into a natural and healthy action. By repeating these remedies, at proper intervals, the particular diseased action is repeatedly suspended, till the system becomes so far insensible to the stimulus of its cause, that the restorative power overcomes it, and the healthy action is at length re-established.

Thus the operation of mercury, in the cure of syphilis, is by producing an action, *different* from that produced by the venereal virus; not merely by increasing or diminishing the *quantity* of action.

In certain other diseases, mercury has been found an effectual remedy, when there is proof of its operating in the system; its action, however, cannot always be produced. When this happens, the morbid power must be supposed to be greater than that of the mercury; so that the latter cannot produce its own action, in the system, on account of the strength with which the morbid action is carried on. All we have to look for, in such cases, is some substance which is more power-

fully active, and which has no peculiar quality detrimental to the powers of the system.

Where there is diseased action, in the system, it is not improbable that some substances operate as remedies, by destroying its exciting cause.

We may mention, likewise, that there are instances where, though no *diseased* action appears, the *quantity of healthy* action is either deficient or excessive; and there are substances proper for answering the indications under both these circumstances. These are such as operate merely to *increase* the quantity of action, and such as immediately *diminish* it.

From these considerations, we are induced to believe, that all remedies may properly be divided into *four classes*; 1. Comprehending all those substances, whose operation is merely an *increase* of healthy action; 2. Those which, immediately, *diminish* the healthy action; 3. Those which destroy the exciting cause of *diseased* action, by a chemical combination; and 4. Those which operate to produce a *peculiar kind* of action. These classes should be again divided into *orders*, according to the degrees of power, which different substances possess.

FINIS.

Three young gentlemen received the
degrees of Bachelors of Medicine at D. University
at this commencement (1802) Daniel Osgood,
Jr., Le Veis, & Jon^a. H. Sparhawk - The
first read a dissertation on Consumption & the
last on hemorrhage (not published) -



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